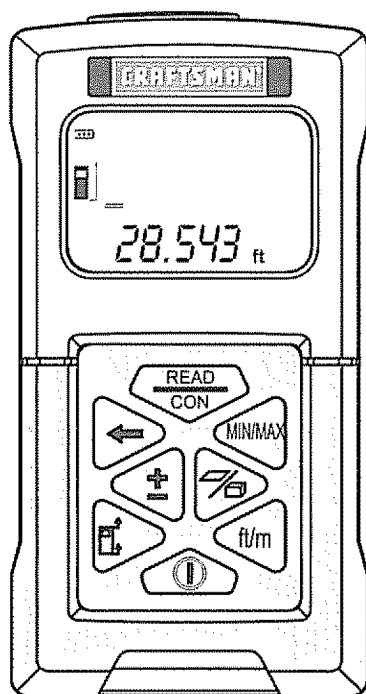


Owner's Manual



Compact Laser Measuring Tool

Model No. 320.48277



⚠ CAUTION! Read, understand and follow all Safety Rules and Operating Instructions in this Manual before using this product.

- Warranty
- Safety instructions
- Unpacking
- Description
- Operation
- Maintenance
- Troubleshooting

Sears, Roebuck and Co., Hoffman Estates, IL 60179

www.craftsman.com

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ONE YEAR FULL WARRANTY ON CRAFTSMAN® PRODUCT

If this Craftsman tool fails to give complete satisfaction within one year from the date of purchase, return it to any Sears store or other Craftsman outlet in the United States for free replacement.

This warranty does not include expendable parts, such as blades and lamps.

This warranty applies for only 90 days from the date of purchase if this product is ever used for commercial or rental purposes.

This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

Sears, Roebuck and Co., Hoffman Estates, IL 60179

SAVE THESE INSTRUCTIONS!

READ ALL INSTRUCTIONS!

SAFETY INSTRUCTIONS

⚠ WARNING: BE SURE to read and understand all instructions in this manual before using this product. Failure to follow all instructions may result in hazardous radiation exposure, electric shock, and/or bodily injury.

⚠ CAUTION: Do not attempt to modify the performance of the laser device in any way. This may result in a dangerous exposure to laser radiation.

⚠ WARNING: LASER RADIATION. Do not stare into beam. Class II laser product. Turn the laser beam on only when using this tool.

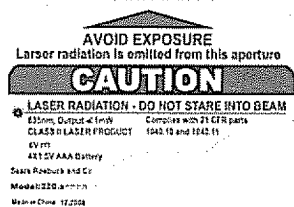
⚠ WARNING: Use of controls, adjustments, or the performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

⚠ WARNING: The use of optical instruments such as, but not limited to, telescopes or transits to view the laser beam will increase eye hazard.

This measuring tool has a built-in laser light. The laser is a Class II and emits output power of a maximum 1mW and 635 wavelengths. These lasers do not normally present an optical hazard. However, do not stare at the beam, as this can cause flash blindness.

The following label is on your laser measuring tool. It indicates the location from which the laser measuring tool emits the laser light. Be aware of the laser light location when using the tool. Always make sure that any bystanders in the vicinity of use are made aware of the dangers of looking directly into the laser.

- **Do not remove or deface any product labels.**
- **Avoid direct eye exposure.** The laser beam can cause flash blindness.
- **The laser measuring tool is not a toy. Always keep it out of the reach of children.** The laser light emitted from this device should never be directed toward any person for any reason.
- **Do not operate the tool around children or allow children to operate the tool.**
- **Do not place the tool in a position that may cause anyone to stare at the laser beam, whether intentionally or unintentionally.**
- **Do not use on surfaces such as sheet steel that have shiny, reflective surfaces.** The reflective surface could reflect the beam back at the operator.
- **Always turn the laser tool off when not in use.** Leaving the tool on increases the risk of someone inadvertently staring into the laser beam.
- **Do not attempt to modify the performance of this laser device in any way.** This may result in a dangerous exposure to laser radiation.



- **Do not** attempt to repair or disassemble the laser-measuring tool. If unqualified persons attempt to repair this product, serious injury may occur. Any repair required on this laser product should be performed only by authorized service personnel.
- **Do not** operate the tool in combustible areas, such as in the presence of flammable liquids, gases, or dust.
- Use of other accessories that have been designed for use with other laser tools could result in serious injury.
- **Keep batteries out of reach of children.**
- For further information regarding lasers, refer to ANSI-Z136.1, the Standard for the Safe Use of Lasers, available from the Laser Institute of America (407) 380-1553.

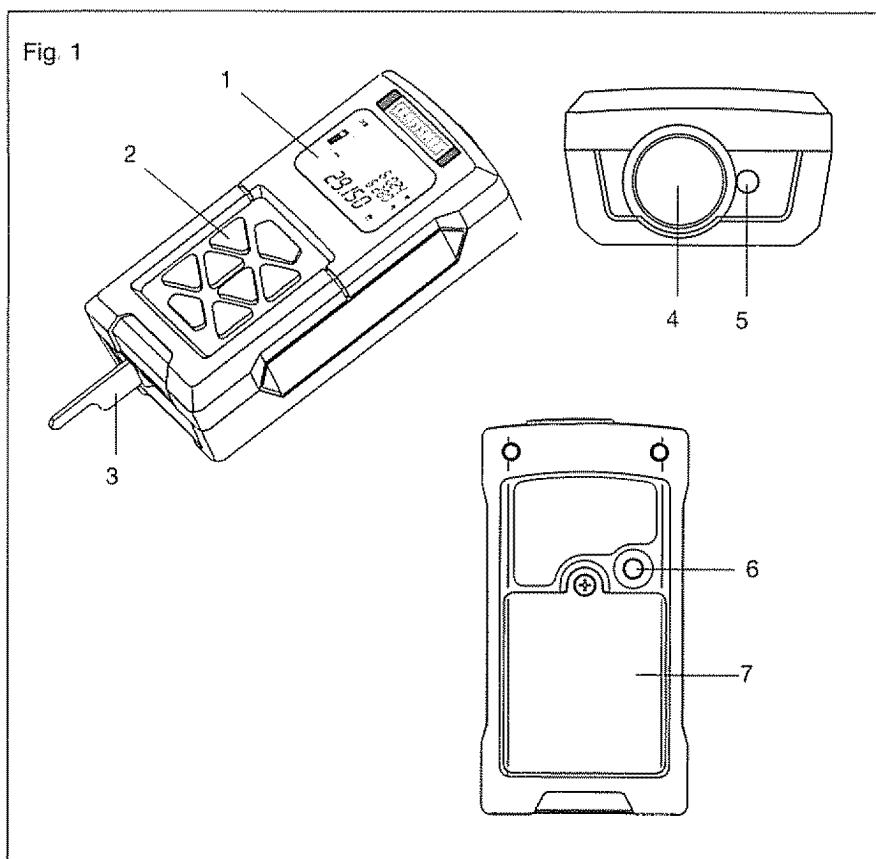
UNPACKING

When unpacking the box, do not discard any packing materials until all of the contents are accounted for:

1. Carefully lift the laser measuring tool out of the carton and place on a stable, flat surface.
2. Open the parts bag to locate the following:
 - Laser measuring tool
 - Owner's manual

DESCRIPTION

KNOW YOUR LASER MEASURING TOOL (Fig. 1)



The laser measuring tool is a highly accurate measuring tool for fast, easy operation:

- Measure distances from 1 foot to 100 feet with an accuracy of $\pm 1/8$ inch.
- The laser measuring tool is intended for:
 - Measuring distances, lengths, heights, and clearances
 - Difficult-to-measure situations: the Pythagorean Theorem mode allows indirect measurement
 - Calculating areas and volumes
 - Use in interior and exterior conditions.

1. LCD display – Large LCD screen with white back lighting helps makes it easy to read the large-numeral measuring data clearly, even in dark conditions.
2. Keyboard
3. Positioning pin- for measurement from wall corners
4. Laser-receiving lens – receives the reflected laser to determine distance
5. Laser-exit aperture – emits the laser dot.
6. 1/4 inch tripod screw- for use with tripod (available separately)
7. Battery compartment – for four AAA batteries (available separately).

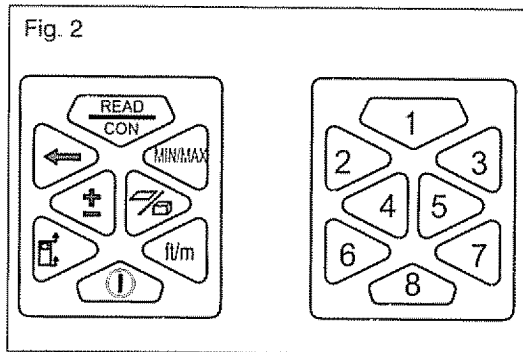
Technical Specifications	
Recommended Use	Indoors
Power supply	4 "AAA" 1.5-volt batteries (available separately)
Laser	$\lambda=635\text{nm}$, Class II laser, maximum laser output<1mW
Measuring range (typically)	1-100 feet (0.3-30m)*
Measuring accuracy (typically)	$\pm 1/8$ inch ($\pm 3\text{mm}$)*
Smallest unit displayed	1/16 inch (1mm)
Automatic switch off:	-laser: 20 seconds -measuring tool: 5 minutes
Estimated battery life (use alkaline AAA batteries)	Up to 5000 single measurements
Optimum operating temperature	32 to 104°F (0 to 40°C)

Note: The tool's measuring range and accuracy will be reduced when it is used in unfavorable conditions, such as in bright sunlight or when measuring to poorly reflecting or very rough surfaces.

KEYBOARD FUNCTION (Fig. 2)


Please see the Operation section of this manual for information about the following functions and computations.

1. Read/Con key - turns on the laser, takes measurements, activates the continuous measurement.
2. Clear key - clears the measurements, reverts to single distance measurement mode.
3. Max/Min key - activates the Maximum or Minimum measuring mode.
4. Plus/Minus key - for addition or subtraction of measurements.
5. Mode key - changes the measuring mode among area, volume, single Pythagorean Theorem, double Pythagorean Theorem, and single distance measurement mode
6. Measuring reference point - Switches the measuring reference among: the rear of the tool, the position of the tripod screw, the front of the tool, and the positioning pin.
7. Unit conversion key - change units: decimal units of feet, 1/16-in. increments, decimal units of inches, 1/16-in. increments of inches, meters, and millimeters.
8. Power key - turns on/off the tool.





LCD DISPLAY


 Full battery indicator


 Empty battery indicator

 Indicates that the measurement is taken from the positioning pin.

 Indicates that the measurement is taken from the bottom of the tool.


 Indicates that the measurement is taken from the position of the tripod screw.



 Indicates that the measurement is taken from the front of the tool.

 Laser beam indicator

 Single distance measurement

 Area measurement

 Volume measurement

-  Single Pythagorean Theorem measurement
-  Double Pythagorean Theorem measurement
- min Minimum measurement indicator
- max Maximum measurement indicator
- Continuous measurement indicator

OPERATION

Your laser measuring tool is a precision instrument. Please observe the following guidelines to ensure optimal performance.

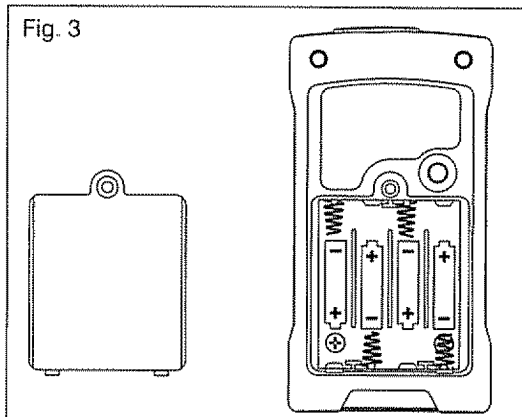
- Do not direct the laser-measuring tool towards the sun or other sources of bright light. This may cause an Error reading or inaccurate measurements.
- Do not use the laser measuring tool as a leveling tool.
- Do not operate the laser measuring tool in wet, dusty, sandy, or other adverse environments. Such conditions may damage inner components and affect measuring accuracy.
- When the laser measuring tool is brought into a warm environment from very cold conditions, or vice versa, allow it to come to the surrounding temperature before use.
- Measuring errors can occur when measuring toward colorless liquids (e.g., water), clean glass, Styrofoam, or similar translucent or low-density materials.
- High-gloss surfaces will deflect the laser beam and result in Error measurements.
- Very bright surroundings combined with a very low reflecting surface will reduce the measuring range and accuracy.
- Do not immerse the tool in water. Wipe off dirt with a damp, soft cloth. Do not use aggressive cleaning agents or solutions. Treat the optical surfaces with the same care that you would apply to eyeglasses or cameras.
- The accuracy of the tool must be checked before use after it has been dropped or subjected to other mechanical stresses.

TO INSTALL BATTERIES (Fig. 3)

This laser measuring tool uses four "AAA" batteries (sold separately).

1. Loosen the screw and open the battery cover.
2. Insert four new "AAA" alkaline batteries according to the polarity indicators in the battery compartment. Be sure the polarity (+/-) is correct!
3. Close the cover and re-tighten the screw.

Fig. 3



NOTE:

- Replace the batteries when the battery indicator shows empty.
- Remove the batteries from the measuring tool when not using it for extended periods.
- The 4 AAA batteries should match each other in brand and type.
- Do not mix old and new batteries.
- Remove depleted batteries immediately, and dispose of them according to your local ordinance. Never dispose of batteries in fire.

TURNING THE LASER MEASURING TOOL ON AND OFF

1. Press the power key "ⓘ" to turn on the tool. The tool will default to the single-distance measuring mode, indicating that the tool is ready to take measurements.
2. Press the power key for about 2 seconds to turn off the tool.
3. When the measuring tool is inactive for 5 minutes, it will automatically turn off to save battery power.

USING THE LASER MEASURING TOOL


Hold the tool at the point from which you want to measure. The default reference setting is from the rear of the tool. By pressing the measuring reference key "⏏", the setting can be changed, so that the next measurement will be taken from the position you set.

To change measuring reference point

Press the measuring reference point key "⏏"; each time the key is pressed, the reference point will change: the rear of the tool, the position of the tripod screw, the front of the tool or the positioning pin.


After powering off, the reference point will automatically default back to rear.


To change the units

Press unit conversion key " " to change the units among decimal units of feet, 1/16-in. increments, decimal units of inches, 1/16-in. increments of inches, meters and millimeters. as shown below.


Setting	Distance	Area	Volume
decimal units of feet	feet (decimal)	feet ²	feet ³
1/16-in. increments	feet & 1/16inch	feet ²	feet ³
decimal units of inches	Inches (decimal)	feet ²	feet ³
1/16-in. increments of inches	inches & 1/16inch	feet ²	feet ³
meters	meters	m ²	m ³
millimeters	millimeters	m ²	m ³

To take measurements

NOTE: The laser will switch off after 20 seconds of inactivity. If a measurement has not been made within the previous 20 seconds, push READ key " " again to turn on the laser.

 **WARNING:** Do not point the laser dot at persons or animals and do not stare into the laser beam or view directly with optical instruments.

Clear function

Push the Clear key " " to erase the current measurement and display the previous measurement.

Single distance measurement

1. Press the Read key
"READ
CON" to turn on the
laser; the laser indicator will
blink from bottom to top
(Fig. 4 & 5).
2. Aim the laser at the target
you want to measure;
3. Press the Read key again to
take a measurement.
4. The length is shown in the
lowest row of the screen in
large numerals, and the laser
beam switches off (Fig. 6).
5. To take a second
measurement, press the
Read key to turn on the
laser again, and the first
measurement data will show
in the upper row of the
screen (Fig. 7).
6. Aim at the new target.
7. Press the Read key again to
take a second measurement.

Fig. 4

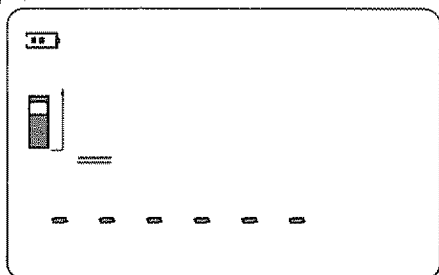


Fig. 5

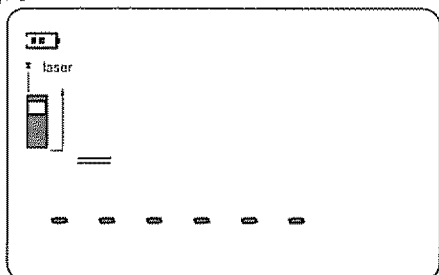


Fig. 6

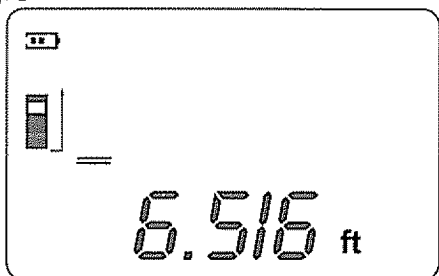
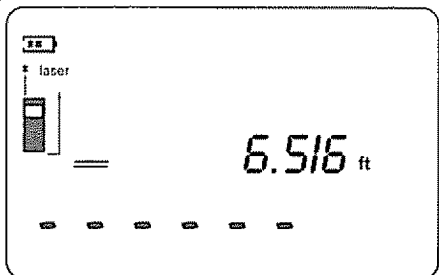


Fig. 7



8. The second length is shown in the lowest row of the screen, and the laser beam switches off (Fig. 8).
9. To take a new measurement, follow steps 5 through 8, above.

NOTE: If after choosing Area, Volume or Pythagorean Theorem measurement modes, press the CLR key to switch back to single-measurement mode.

Area measurement





1. Press the " " Mode key to choose area measurement mode; the blinking line in " " icon indicates the length to be measured (Fig. 9).
2. Press the Read key " " to turn on the laser beam; the laser indicator will blink. (Fig. 10).
3. Position the tool to aim the laser dot at the target to which you want to measure.
4. Press the Read key to display the measured length in first row of the screen. (Fig. 11).
5. The width line in the " " icon will start to blink.
6. Position the tool to aim the laser dot at the width target.

Fig. 8

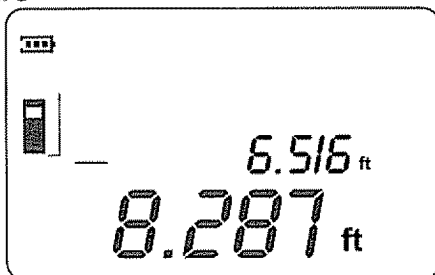


Fig. 9

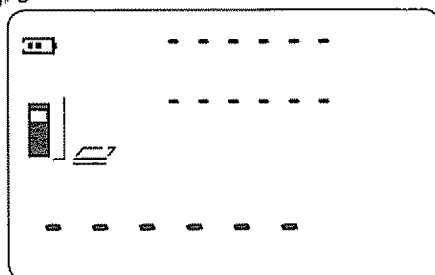


Fig. 10

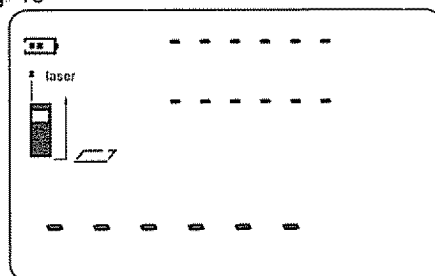
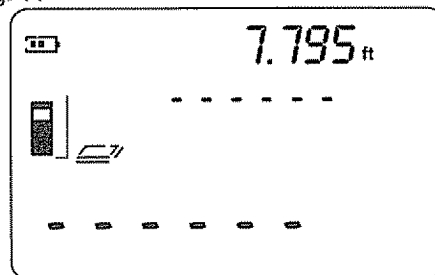


Fig. 11



- Press the Read key again to display the area in the lowest row of the screen; the width will be displayed at the same time in the second row (Fig. 12).
- Press the Read key to make a new measurement.

Volume measurement




- Press the Mode key  to choose volume measurement mode. The blinking line in the  icon indicates the length to be measured (Fig. 13).
- Press the Read key to turn on the laser beam; the laser indicator will blink from bottom to top (Fig. 14).
- Position the tool to aim the laser dot at the target to which you want to measure.
- Press the Read key to display the measured length in the first row of the screen. The width line in the  icon will also start to blink (Fig. 15).
- Position the tool to aim the laser at the target.

Fig. 12

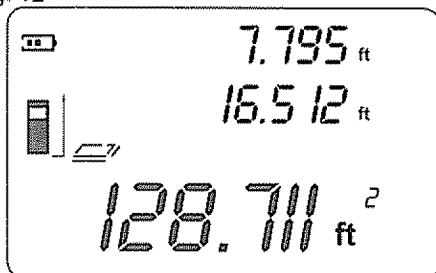


Fig. 13

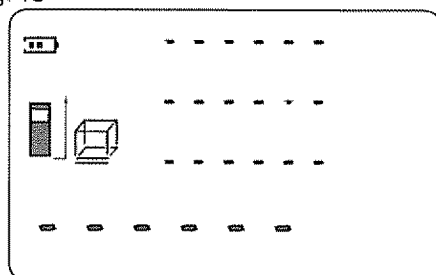


Fig. 14

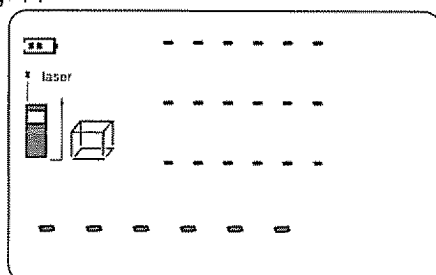
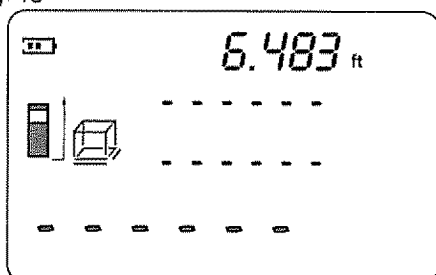


Fig. 15



6. Press the Read key again to display the width in the second row of the screen (Fig. 16);
7. The height line in the "H" icon will start to blink (Fig. 16).
8. Press the Read key again to display the volume in the lowest row of the screen; the height will be displayed at the same time in the third row of the screen (Fig. 17).
9. Press the Read key to make a new measurement.

Single Pythagorean Theorem measurement mode

The Pythagorean Theorem measurement mode is used to measure distances that cannot be measured directly because an obstacle would obstruct the laser beam or no target surface is available as a reflector. Correct results are achieved only when the laser beam and the sought distance form a precise right angle (90°).

In the illustrated example (Fig. 18), the length BC is the unknown distance to be determined. For this purpose, AB and AC must be measured. AC and BC must form a right angle.

1. Press the Mode key "H" to choose single Pythagorean Theorem measurement mode (Fig. 19).
2. The blinking line in "H" indicates the distance AB to be measured.

Fig. 16

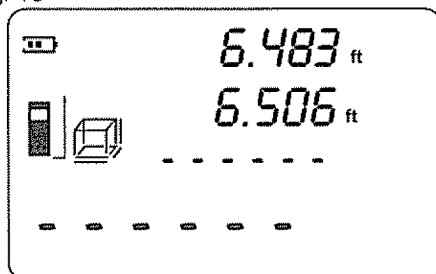


Fig. 17

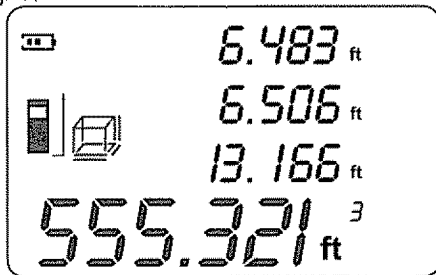


Fig. 18

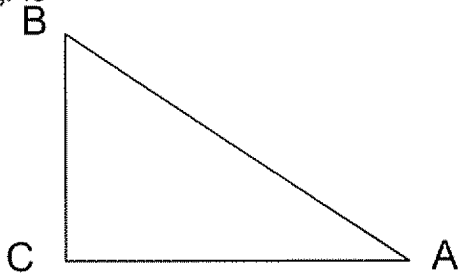
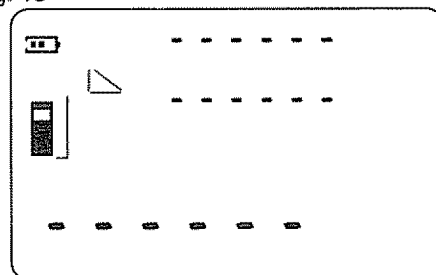


Fig. 19



3. Press the Read key to turn on the laser beam; the laser indicator blinks (Fig. 20).
4. Position the tool to aim the laser at the target B.
5. Press the Read key to display the measured length of AB in the first row of the screen (Fig. 21).
6. The blinking line in " \triangle " indicates the distance AC to be measured.
7. Without changing the measuring reference point location of the tool in position A, aim the laser dot perpendicularly to the target C.
8. Press the Read key again to display the calculated length of BC in the lowest row of the screen; the distance AC will be displayed at the same time in the second row (Fig. 22).
9. Press the Read key to make a new measurement.

NOTES:

- The distance AC should be shorter than the hypotenuse (AB); otherwise the LCD will display "Err008" reminding you to re-measure the distance AC.
- When taking the two measurements, make sure they are taken from the same starting point (A) and the second measurement is perpendicular to the target C. Taking the measurements correctly will help result in the most accurate calculated distance.

Fig. 20

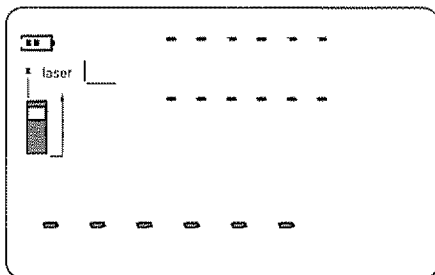


Fig. 21

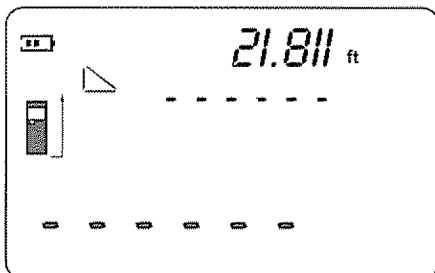
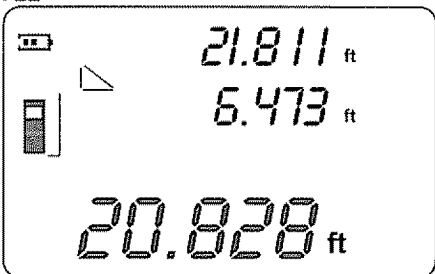


Fig. 22



Double Pythagorean Theorem measurement

Use the double Pythagorean measurement mode when one end of the length to be measured indirectly is higher than the measurement position and the other end of that length is lower than the measurement position.

In the illustrated example (Fig. 23), the length BC is to be determined, A is the measurement position. For this purpose, AB, AO and AC must be measured. AO and BC must form right angles.

Fig. 23

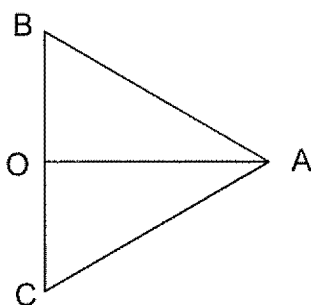


Fig. 24

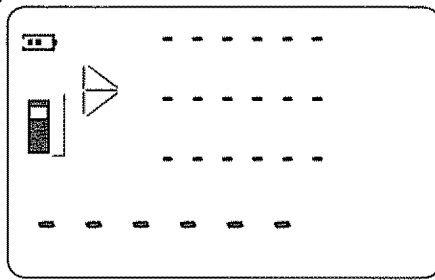


Fig. 25

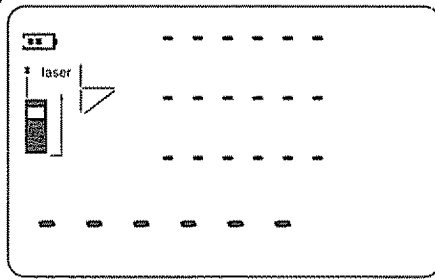
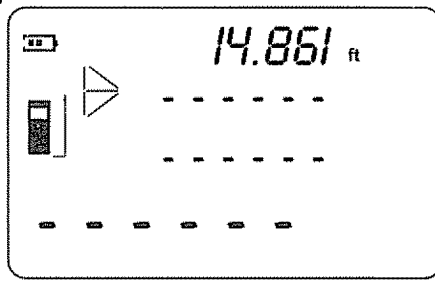





Fig. 26



1. Press the Mode key " " to choose double Pythagorean Theorem measurement mode (Fig. 24).
2. The blinking line in " " indicates the distance AB to be measured.
3. Press the Read key to turn on the laser beam; the laser indicator blinks (Fig. 25).
4. Position the tool to aim the laser at the target B.
5. Press the Read key to display the measured length of AB in the first row of the screen (Fig. 26).
6. The blinking line in " " indicates the distance AO to be measured.
7. Without changing measuring reference point location of the tool in position A, aim the laser dot perpendicularly to the target O.

8. Press the Read key to display the measured length of AO in the second row of the screen (Fig. 27).
9. The blinking line in "➤" indicates the distance AC to be measured.
10. Without changing the measuring reference point location of the tool in position A, aim the laser dot at the target C.
11. Press the Read key again to display the indirect length of BC in the lowest row of the screen; the distance AC will be displayed at the same time in the third row (Fig. 28).
12. Press the Read key to make a new measurement

Fig. 27

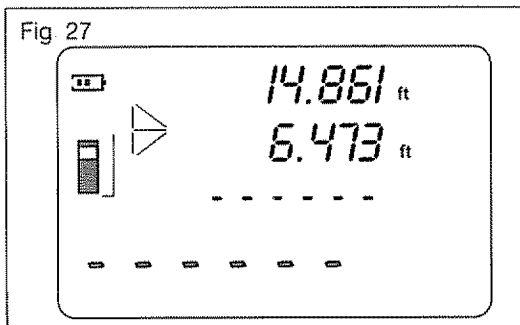
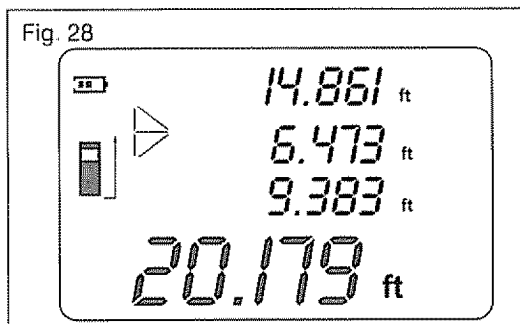


Fig. 28



Continuous Measurement (Locating)

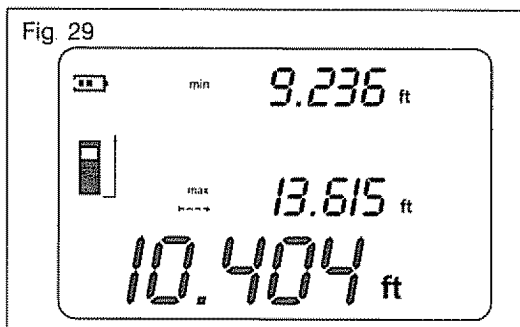
The continuous measurement function (locating) is used for transferring measurements, e.g., from construction plans. In the continuous measurement mode the measuring tool can be moved relative to the target, and the measured value is updated approx. every 0.5 seconds in the display.

For example, the user can measure the distance from the tool to a wall and then move away from that wall while the actual distance is displayed continuously, informing the user when the correct distance has been reached.

1. Press the Mode key "➤" to choose the single-distance measurement mode. If in another mode, press the clear key to go back to the single-distance measurement mode.
2. Press the Read key and hold it for about 3 seconds to activate the continuous measurement mode.
3. Move the tool until the required distance value is indicated at the bottom of the display

4. Press any key to interrupt the continuous measurement. The current measured value is indicated in the lowest row of the screen. The minimum and maximum values will be displayed in the first and second row of the screen (Fig. 29).
5. Press the read key again to start a new continuous measuring sequence.

Fig. 29





Minimum/Maximum measurement

This function allows the user to measure the minimum or maximum distance measured from a fixed measuring point. It is commonly used to measure diagonal distances (maximum values), horizontal distances, or vertical distance (minimum values).

The function can be transferred in area, volume, Pythagorean Theorem measurement and single-distance measurement modes.

Min/Max function can help eliminate the measuring deviation caused by not correctly holding the tool and aiming at the target. It can help to get an accurate calculation of area, volume and indirect length.

1. Press the Mode key " " to choose area, volume or Pythagorean Theorem measurement mode.
2. Press the Min/Max key " " to activate the Min/Max function.
3. Press the Read key to turn on the laser, aim the laser beam at the target you want to measure and press it again to start the minimum or maximum measuring.
4. Slowly sweep the laser left and right or up and down over the desired target point.
5. Press any key to interrupt the Min/Max measuring; the minimum or maximum value will be displayed on the related row of the screen as an accurate length for calculation.

Addition and subtraction

The single-distance, area, volume, and indirect length can be added or subtracted by the addition and subtraction function.

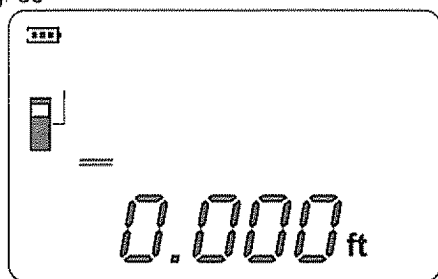
1. Take the first measurement.
2. Press " \pm " key; the symbol + or - will show behind the battery indicator.
3. Take the second measurement
4. The sum of the measurements will be displayed in the lowest row of the screen, and the last measurements will be displayed at the same time in the upper row of the screen.
5. Follow the same method to make additional calculations.

Working with the tripod (available separately)

The use of a tripod is particularly helpful for greater distances. The measuring tool can be screwed onto a commercially available tripod using the 1/4" thread on the bottom side of the housing.

1. Mount the tool to the tripod.
2. Set the measuring reference to the thread (Fig. 30).
3. Start to take measurements.

Fig. 30



Error signals

The following error signals may appear on the screen of your tool:

Code	Explanations
Err001	The reflected laser light is too intense.
Err002	Out of range, The measuring range for this tool is from 1-100 feet.
Err003	The target provides poor reflection of the laser; change to another target or cover the target with a piece of white paper.
Err004	The temperature is too high; the optimum operating temperature is 32 to 104°F (0 to 40°C).
Err005	The temperature is too low; the optimum operating temperature is 32 to 104°F (0 to 40°C).
Err006	Low battery, a reminder to replace the batteries.
Err007	Strong vibration, or the tool was moved quickly when measuring; always keep it steady when taking a measurement.
Err008	Wrong input, the length of one side of the right triangle as measured is longer than the hypotenuse; re-measure.

MAINTENANCE

This laser measuring tool has been designed to be a low-maintenance tool. However, in order to maintain its performance, you must always follow these simple directions.

1. **Always** handle the tool with care. Treat it as an optical device, such as a camera or binoculars.
2. **Avoid** exposing the tool to shock, continuous vibration or extreme hot or cold temperature.
3. **Always** store the tool indoors. When not in use, **ALWAYS** store the tool in its protective case.
4. **Always** Keep the tool free of dust and liquids. Use only a clean, soft cloth for cleaning. If necessary, slightly moisten the cloths with pure alcohol or a little water.
5. **Do not** touch the lens with your fingers.
6. Check the batteries regularly to avoid deterioration. **ALWAYS** remove the batteries from the tool, if it is not going to be used for an extended period of time.
7. Replace the batteries when the battery icon is continuously empty displayed on the LCD.
8. **Do not** disassemble the laser measuring tool; this will expose the user to hazardous radiation exposure.
9. **Do not** attempt to change any part of the laser lens.

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Tool cannot be switched on	Batteries are installed incorrectly	Reinstall the batteries according to the polarity indicators in the battery compartment
	Batteries are low voltage	Replace with new batteries
LCD displays "Err001"	The reflected laser light is too intense.	Do not direct the laser at a highly reflective surface; cover the surface with white paper if necessary.
LCD displays "Err002"	The measurement exceeds the measuring range of the tool.	Take measurement within the range: 1 to 100 feet.
LCD displays "Err003"	The target does not adequately reflect the laser.	Change the measuring target or cover it with a piece of white paper.
LCD displays "Err004"	The temperature is too high.	Wait until the measuring tool has reached the operating temperature: 32 to 104°F (0 to 40°C).
LCD displays "Err005"	The temperature is too low.	Wait until the measuring tool has reached the operating temperature: 32 to 104°F (0 to 40°C).
LCD displays "Err006"	Low battery	Insert new batteries.
LCD displays "Err007"	Excessive vibration; you moved the tool quickly when taking a measurement	Always keep the tool steady.
LCD displays "Err008"	The length of one side of the right triangle measured is longer than the hypotenuse.	Re-measure; the hypotenuse is always longer than the first side length

NOTES

NOTES

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